What is Claimed is:

1. A powder batch comprising sulfur-containing phosphor particles, wherein said phosphor particles have a weight average particle size of not greater than about 5 μm and a particle size distribution wherein at least about 90 weight percent of said particles are not larger than twice said average particle size.

2. A powder batch as recited in Claim 1, wherein at least about 95 weight percent of said particles are not larger than twice said average particle size.

3. A powder batch as recited in Claim 1, wherein at least about 90 weight percent of said particles are not larger than 1.5 times said average particle size.

4. A powder batch as recited in Claim 1, wherein said average particle size is from about 0.3 μm to about 3 μm.

5. A powder batch as recited in Claim 1, wherein said phosphor particles comprise a host-material selected from the group consisting of metal sulfides, oxysulfides and thiogallates.

6. A powder batch as recited in Claim 1, wherein said phosphor particles comprise a host material selected from the Group 2 metal sulfides.

7. A powder batch as recited in Claim 1, wherein said phosphor particles comprise a metal sulfide host material selected from the group consisting of CaS, SrS and BaS.

8. A powder batch as recited in Claim 1, wherein said phosphor particles comprise a host material selected from the Group 12 metal sulfides.

9. A powder batch as recited in Claim 1, wherein said phosphor particles comprise a metal sulfide host material selected from the group consisting of ZnS and CDs.

10. A powder batch as recited in Claim 1, wherein said phosphor particles comprise a mixed-metal sulfide host material having the formula $M^1_xM^2_{1-x}S$, wherein M^1 and M^2 are

selected from the Group 2 metals.

11. A powder batch as recited in Claim 1, wherein said phosphor particles comprise a mixed-metal sulfide host material having the formula $M^1_xM^2_{1-x}S$, wherein M^1 and M^2 are selected from the Group 12 metals.

12. A powder batch as recited in Claim 1, wherein said phosphor particles comprise an oxysulfide host material.

13. A powder batch as recited in Claim 1, wherein said phosphor particles comprise a rare-earth oxysulfide host material.

14. A powder batch as recited in Claim 1, wherein said phosphor particles comprise an oxysulfide host material selected from the group consisting of Y_2O_2S, La_2O_2S and Gd_2O_2S.

15. A powder batch as recited in Claim 1, wherein said phosphor particles comprise a thiogallate host material.

16. A powder batch as recited in Claim 1, wherein said phosphor particles comprise a thiogallate host material of the general formula MGa_2S_4 wherein M is selected from the group consisting of Sr, Ca, Ba and Mg .

17. A powder batch as recited in Claim 1, wherein said phosphor particles comprise at least a first activator ion.

18. A powder batch as recited in Claim 1, wherein said phosphor particles comprise from about 0.02 to about 15 atomic percent of an activator ion.

19. A powder batch as recited in Claim 1, wherein said phosphor particles comprise a Group 2 metal sulfide host material and a rare-earth activator ion.

20. A powder batch as recited in Claim 1, wherein said phosphor particles comprise a Group 2 metal sulfide host material and an activator ion selected from the group consisting of Cu, Ce, Mn, Ag, Al, Au, Cl, Eu, Tb, Ga and mixtures thereof.

21. A powder batch as recited in Claim 1, wherein said phosphor particles comprise crystallites having an average crystallite size of at least about 25 nanometers.

22. A powder batch as recited in Claim 1, wherein said phosphor particles comprise crystallites having an average crystallite size of at least about 40 nanometers.

23. A powder batch as recited in Claim 1, wherein said phosphor particles are substantially spherical.

24. A powder batch as recited in Claim 1, wherein not greater than about 1 weight percent of said phosphor particles are in the form of hard agglomerates.

25. A powder batch as recited in Claim 1, wherein said phosphor particles comprise a substantially uniform coating on an outer surface thereof.

26. A powder batch as recited in Claim 1, wherein said phosphor particles comprise a substantially uniform metal oxide coating on an outer surface thereof.

27. A powder batch comprising metal sulfide phosphor particles wherein said metal sulfide phosphor particles comprise a metal sulfide host material, and wherein said particles are substantially spherical, have a weight average particle size of not greater than about 5μm and a particle size distribution wherein at least about 90 weight percent of said particles are not larger than twice said average particle size.

28. A powder batch as recited in Claim 27, wherein said phosphor particles have a particle size distribution wherein at least about 95 weight percent of said particles are not larger than twice said average particle size.

29. A powder batch as recited in Claim 27, wherein said phosphor particles comprise a host material selected from the Group 2 metal sulfides.

30. A powder batch as recited in Claim 27, wherein said phosphor particles comprise a metal sulfide host material selected from the group consisting of CaS, SrS and BaS.

31. A powder batch as recited in Claim 27, wherein said phosphor particles comprise a host material selected from the Group 12 metal sulfides.

32. A powder batch as recited in Claim 27, wherein said phosphor particles comprise a metal sulfide host material selected from the group consisting of ZnS and CDS.

33. A powder batch as recited in Claim 27, wherein said phosphor particles further comprise from about 0.02 to about 15 atomic percent of an activator ion.

34. A powder batch as recited in Claim 27, wherein said phosphor particles further comprise from about 0.02 to about 15 atomic percent of an activator ion selected from the group consisting of rare-earth elements, Cu, Mn, Ag, Al, Au, Cl, Ga and mixtures thereof.

35. A powder batch as recited in Claim 27, wherein said phosphor particles comprise crystallites having an average crystallite size of at least about 25 nanometers.

36. A powder batch as recited in Claim 27, wherein said phosphor particles

comprise a substantially uniform metal oxide coating on an outer surface thereof.

37. A powder batch comprising mixed metal sulfide phosphor particles comprising a host material having the general formula $M^1_xM^2_{1-x}S$, wherein said phosphor particles have a weight average particle size of not greater than about 10 μm and a particle size distribution wherein at least about 90 weight percent of said particles are not larger than twice said average particle size.

38. A powder batch as recited in Claim 37, wherein said weight average particle size is not greater than about 5 μm.

39. A powder batch as recited in Claim 37, wherein M^1 and M^2 are selected from the Group 2 metals.

40. A powder batch as recited in Claim 37, wherein M^1 and M^2 are selected from the Group 12 metals.

41. A powder batch as recited in Claim 37, wherein said phosphor particles further comprise from about 0.02 to about 15 atomic percent of an activator ion.

42. A powder batch as recited in Claim 37, wherein said phosphor particles are substantially spherical.

43. A powder batch as recited in Claim 37, wherein said phosphor particles comprise crystallites having an average crystallite size of at least about 25 nanometers.

44. A powder batch as recited in Claim 37, wherein said phosphor particles further comprise from about 0.02 to about 15 atomic percent of an activator ion selected from the group consisting of rare-earth elements, Cu, Mn, Ag, Al, Au, Cl, Ga and mixtures thereof.

45. A powder batch comprising oxysulfide phosphor particles comprising an oxysulfide host material, wherein said phosphor particles have a weight average particle size of not greater than about 5 μm and a particle size distribution wherein at least about 90 weight percent of said particles are not larger than twice said average particle size.

46. A powder batch as recited in Claim 45, wherein said phosphor particles comprise a rare-earth oxysulfide host material.

47. A powder batch as recited in Claim 45, wherein said phosphor particles comprise a host material selected from Y_2O_2S and Gd_2O_2S.

48. A powder batch as recited in Claim 45, wherein said phosphor particles further comprise from about 0.02 to about 15 atomic percent of an activator ion.

49. A powder batch as recited in Claim 45, wherein said phosphor particles are substantially spherical.

50. A powder batch as recited in Claim 45, wherein said phosphor particles comprise crystallites having an average crystallite size of at least about 25 nanometers.

51. A powder batch as recited in Claim 45, wherein said phosphor particles further comprise from about 0.02 to about 15 atomic percent of an activator ion selected from the group consisting of rare-earth elements, Cu, Mn, Ag, Al, Au, Cl, Ga and mixtures thereof.

52. A powder batch comprising thiogallate phosphor particles comprising a thiogallate host material, wherein said phosphor particles have a weight average particle size of not greater than about 5 μm.

53. A powder batch as recited in Claim 52, wherein said average particle size is from about 0.3 μm to about 3 μm.

54. A powder batch as recited in Claim 52, wherein said particles have a particle size distribution wherein at least about 90 weight percent of said particles are not larger than twice said average particle size.

55. A powder batch as recited in Claim 52, wherein said phosphor particles comprise a thiogallate host material selected from the group consisting of $SrGa_2S_4$, $CaGa_2S_4$, $BaGa_2S_4$, $MgGa_2S_4$ and solid solutions thereof.

56. A powder batch as recited in Claim 52, wherein said phosphor particles comprise a thiogallate host material having the general formula $M^1M^2_xGa_{2-x}S_4$, wherein M^1 is selected from Sr, Ca, Ba and Mg and wherein M^2 is selected from Al and In.

57. A powder batch as recited in Claim 52, wherein said phosphor particles comprise a thiogallate host material having the general formula $Sr_xCa_{1-x}Ga_2S_4$.

58. A powder batch as recited in Claim 52, wherein said phosphor particles further comprise from about 0.02 to about 15 atomic percent of an activator ion.

59. A powder batch as recited in Claim 52, wherein said phosphor particles further comprise an activator ion selected from the group consisting of rare-earth elements, Cu and Ga.

60. A powder batch as recited in Claim 52, wherein said powder batch comprises no greater than about 1 atomic percent impurities.

61. A powder batch as recited in Claim 52, wherein said phosphor particles have

a quantum efficiency of at least about 90 percent.

62. A powder batch as recited in Claim 52, wherein said phosphor particles comprise crystallites having an average crystallite size of at least about 25 nanometers.

63. A powder batch as recited in Claim 52, wherein said phosphor particles are coated particles comprising a coating substantially encapsulating said particles.

64. A powder batch comprising sulfur-containing phosphor particles comprising a host material selected from the group consisting of Group 2 metal sulfides, wherein said phosphor particles have a weight average particle size of not greater than about 5 μm.

65. A powder batch as recited in Claim 64, wherein said average particle size is from about 0.3 μm to about 3 μm.

66. A powder batch as recited in Claim 64, wherein said particles have a particle size distribution wherein at least about 90 weight percent of said particles are not larger than twice said average particle size.

67. A powder batch as recited in Claim 64, wherein said host material is CaS.

68. A powder batch as recited in Claim 64, wherein said host material is SrS.

69. A powder batch as recited in Claim 64, wherein said host material is BaS.

70. A powder batch as recited in Claim 64, wherein said host material is MgS.

71. A powder batch as recited in Claim 64, wherein said phosphor particles further comprise an activator ion selected from the group consisting of rare-earth elements, Cu, Mn, Ag, Al, Au, Ga and Cl.

72. A powder batch as recited in Claim 64, wherein said phosphor particles are substantially spherical.

73. A powder batch comprising coated sulfur-containing phosphor particles, wherein said coated phosphor particles have a weight average particle size of not greater than about 5 μm and a particle size distribution wherein at least about 90 weight percent of said particles are smaller than twice said average particle size and wherein said phosphor particles comprise at least a first coating on an outer surface thereof.

74. A powder batch as recited in Claim 73, wherein said first coating substantially encapsulates said phosphor particles.

75. A powder batch as recited in Claim 73, wherein said first coating is a substantially uniform non-particulate coating.

76. A powder batch as recited in Claim 73, wherein said first coating is a substantially uniform particulate coating.

77. A powder batch as recited in Claim 73, wherein said first coating has an average thickness of not greater than about 100 nanometers.

78. A powder batch as recited in Claim 73, wherein said first coating has an average thickness of from about 2 nanometers to about 10 nanometers.

79. A powder batch as recited in Claim 73, wherein said first coating comprises a compound selected from the group consisting of metals, metal oxides, metal sulfides, phosphates and oxysulfides.

80. A powder batch as recited in Claim 73, wherein said coating consists essentially of a conductive metal.

81. A powder batch as recited in Claim 73, wherein said coating comprises copper metal.

82. A powder batch as recited in Claim 73, wherein said first coating consists essentially of a metal oxide.

83. A powder batch as recited in Claim 73, wherein said first coating comprises a metal oxide selected from the group consisting of SiO_2, Al_2O_3, ZrO_2, SnO_2, ZnO, SnO_2, SnO, B_2O_5, TiO_2, CuO_2, CuO, In_2O_3 and $In_xSn_{1-x}O_y$.

84. A powder batch as recited in Claim 73, wherein said first coating comprises a pigment.

85. A powder batch as recited in Claim 73, wherein said coating comprises an organic compound.

86. A powder batch as recited in Claim 73, wherein said coating comprises a monolayer coating.

87. A powder batch as recited in Claim 73, wherein said phosphor particles further comprise a second coating substantially encapsulating said first coating.

88. A powder batch as recited in Claim 73, wherein said phosphor particles comprise crystallites having an average crystallite size of at least about 25 nanometers.

89. A powder batch as recited in Claim 73, wherein said phosphor particles are substantially spherical.

90. A powder batch as recited in Claim 37, wherein said average particle size is from about 0.3 μm to about 3 μm.

91. A powder batch comprising composite sulfur-containing phosphor particles, wherein said composite phosphor particles have a weight average particle size of not greater than about 5 μm and a particle size distribution wherein at least about 90 weight percent of said particles are smaller than twice said average particle size and wherein said phosphor particles comprise at least a first sulfur-containing phosphor compound phase and at least a second phase.

92. A powder batch as recited in Claim 91, wherein said second phase comprises a second sulfur-containing compound.

93. A powder batch as recited in Claim 91, wherein said second phase comprises a metal oxide.

94. A powder batch as recited in Claim 91, wherein said particles are substantially spherical.

95. A powder batch comprising a particulate precursor to a sulfur-containing phosphor, wherein said particulate precursor has a weight average particle size of not greater than about 5 μm and a particle size distribution wherein at least about 90 weight percent of said particles are smaller than twice said average particle size, wherein said particulate precursor is adapted to be converted into a sulfur-containing phosphor having a weight average particle size of not greater than about 5 μm and a particle size distribution wherein at least about 90 weight percent of said particles are smaller than twice said average particle size.

96. A powder batch as recited in Claim 95, wherein said particulate precursor comprises metal oxides.

97. A powder batch as recited in Claim 95, wherein said sulfur-containing phosphor comprises a thiogallate.

98. A method for the production of sulfur-containing phosphor particles, comprising the steps of:

a) generating an aerosol of droplets from a liquid wherein said liquid comprises a sulfur-containing phosphor precursor and wherein said droplets have a size distribution such that at least about 80 weight percent of said droplets have a size of from about 1 μm to about 5 μm;

b) moving said droplets in a carrier gas; and

c) heating said droplets to remove liquid therefrom and form sulfur-containing phosphor particles.

99. A method as recited in Claim 98, wherein said heating step comprises passing said droplets through a heating zone having a temperature of from about 500° C to about 1400° C.

100. A method as recited in Claim 98, wherein said droplets have a size distribution such that no greater than about 20 weight percent of the droplets in said aerosol are larger than about twice the weight average droplet size.

101. A method as recited in Claim 98, further comprising the step of removing a portion of droplets from said aerosol, said removed droplets having aerodynamic diameter greater than a preselected maximum diameter.

102. A method as recited in Claim 98, further comprising the step of removing a second portion of said droplets from said aerosol, wherein said second portion of droplets have an aerodynamic diameter less than a preselected minimum diameter.

103. A method as recited in Claim 98, wherein said liquid is a solution comprising thiocarboxylic acid.

104. A method as recited in Claim 98, further comprising the step of coating an outer

surface of said sulfur-containing phosphor particles.

105. A method as recited in Claim 98, further comprising the step of annealing said phosphor particles.

106. A method for the production of coated sulfur-containing phosphor particles, comprising the steps of:

a) forming a liquid solution comprising a sulfur-containing phosphor precursor;

b) generating an aerosol of droplets from said liquid solution;

c) moving said droplets in a carrier gas;

d) heating said droplets to remove liquid therefrom and form particles comprising a sulfur-containing phosphor; and

e) coating an outer surface of said sulfur-containing phosphor particles.

107. A method as recited in Claim 106, wherein said coating step comprises contacting said phosphor particles with a volatile coating precursor.

108. A method as recited in Claim 106, wherein said coating step comprises contacting said phosphor particles with a volatile coating precursor selected from the group consisting of metal chlorides, metal acetates and metal alkoxides.

109. A method as recited in Claim 106, wherein said coating step comprises contacting said phosphor particles with a volatile coating precursor selected from the group consisting of silicon tetrachloride and aluminum trichloride.

110. A method as recited in Claim 106, wherein said heating step comprises passing said droplets through a heating zone having a temperature of from about 500° C to about 1400° C.

111. A method as recited in Claim 106, wherein said phosphor particles have a particle density of at least about 90 percent of the theoretical density for said phosphor particles.

112. A method as recited in Claim 106, wherein said aerosol droplets have an

average size of from about 1 μm to about 5 μm and wherein not greater than about 20 weight percent of said droplets have a size greater than about twice said average droplet size.

113. A method as recited in Claim 106, further comprising the step of removing at least a first portion of droplets from said aerosol wherein said droplets in said removed first portion have an aerodynamic diameter greater than a preselected maximum diameter.

114. A method as recited in Claim 106, further comprising the step of removing a second portion of said droplets from said aerosol, wherein said droplets in said removed second portion have an aerodynamic diameter less than a preselected minimum diameter.

115. A method as recited in Claim 106, wherein said liquid solution comprises thiocarboxylic acid .

116. A method as recited in Claim 106, wherein said coating is a metal oxide.

117. A method as recited in Claim 106, wherein said coating has an average thickness of not greater than about 100 nanometers.

118. A method as recited in Claim 106, wherein said coating is selected from the group consisting of SiO_2, Al_2O_3, ZrO_2, B_2O_5, TiO_2, Cu_2O, CuO, SnO_2, SnO, ZnO, Bi_2O3, In_2O_3 and $In_x Sn_{1-x}O_Y$.

119. A method for the production of a sulfur-containing phosphor powder, comprising the steps of:

a) forming an aqueous-based solution comprising soluble precursors of a sulfur-containing phosphor;

b) generating an aerosol of droplets from said aqueous-based solution;

c) heating said droplets to form a particulate intermediate compound that is capable of being post-treated to form said sulfur-containing phosphor compound; and

d) treating said particulate intermediate compound to form said sulfur-containing phosphor powder.

120. A method as recited in Claim 119, wherein said method further comprises the step of milling said phosphor powder.

121. A method as recited in Claim 119, wherein said method further comprises the step of annealing said phosphor powder.

122. A method as recited in Claim 119, wherein said particulate intermediate compound has an average particle size of from about 0.3 to about 3 μm.

123. A method as recited in Claim 119, wherein said method further comprises the step of annealing said phosphor powder in contact with sulfur or a sulfur-containing compound.

124. A method as recited in Claim 119, wherein said method further comprises the step of annealing said phosphor powder in contact with H_2S gas at a temperature and for a time sufficient to form said sulfur-containing phosphor powder.

125. A method as recited in Claim 119, wherein said sulfur-containing phosphor is selected from the Group 2 and Group 12 metal sulfides.

126. A method as recited in Claim 119, wherein said sulfur-containing phosphor is

a thiogallate.

127. A method as recited in Claim 119, wherein said aqueous-based solution further comprises a precursor to an activator ion.

128. A method for the production of a thiogallate phosphor powder of the form $M^1M^2_x Ga_{2-x}S_4$, comprising the steps of:

a) forming an aqueous-based solution comprising soluble precursors of a metal M^1 and gallium;

b) generating an aerosol of droplets from said aqueous-based solution;

c) heating said droplets to form a particulate intermediate compound that is capable of being post-treated to form said thiogallate phosphor; and

d) treating said particulate intermediate compound to form said thiogallate phosphor powder.

129. A method as recited in Claim 128, wherein said metal M^1 is selected from the group consisting of Ca, Sr, Ba, Mg and mixtures thereof.

130. A method as recited in Claim 128, wherein M^2 is selected from the group consisting of Al and In.

131. A method as recited in Claim 128, wherein x is equal to zero.

132. A method as recited in Claim 128, wherein said particulate intermediate compound has a weight average particle size of from about 0.3 to about 3 μm.

133. A method as recited in Claim 128, wherein said soluble precursors comprise nitrate salts.

134. A method as recited in Claim 128, wherein said heating step comprises heating said droplets to a temperature of from about 700°C to about 900°C.

135. A method as recited in Claim 128, wherein said intermediate compound comprises an oxide of the metal M and Ga.

136. A method as recited in Claim 128, wherein said aqueous-based solution further comprises a precursor to an activator ion.

137. A method as recited in Claim 128, wherein said aqueous-based solution further comprises a precursor to an activator ion selected from the group consisting of rare-earth elements, Cu and Ga .

138. A method as recited in Claim 128, wherein said thiogallate phosphor powder comprises not greater than about 1 atomic percent impurities.

139. A method as recited in Claim 128, wherein said treating step comprises contacting said intermediate product with a sulfur-containing solid, liquid or gas composition at an elevated temperature.

140. A method as recited in Claim 128, wherein said treating step comprises contacting said intermediate product with a gas composition comprising H_2S gas for a time and at a temperature to convert substantially all of said intermediate compound to said thiogallate compound.

141. A method as recited in Claim 128, wherein said treating step comprises contacting said intermediate product with a gas composition comprising H_2S gas at a temperature of from about 800°C to about 1100°C.

142. A method as recited in Claim 128, further comprising the step of annealing said thiogallate phosphor powder.

143. A method as recited in Claim 128, further comprising the step of annealing said thiogallate phosphor powder at a temperature of from about 800°C to about 1100°C.

144. A method for the production of coated sulfur-containing phosphor particles, comprising the steps of:

a) forming a liquid solution comprising a sulfur-containing phosphor precursor and a coating precursor;

b) generating an aerosol of droplets from said liquid solution;

c) moving said droplets in a carrier gas; and

d) heating said droplets to remove liquid therefrom and form coated sulfur-containing phosphor particles.

145. A method as recited in Claim 144, wherein said sulfur-containing phosphor precursor comprises a suspension of phosphor precursor particles.

146. A method as recited in Claim 144, wherein said coating precursor is selected from aluminum compounds and silicon compounds.

147. A method as recited in Claim 144, wherein said coating precursor comprises solid particulates suspended in said liquid solution.

148. A method for the production of composite sulfur-containing phosphor particles, comprising of steps of:

a) forming a liquid solution comprising a sulfur-containing phosphor precursor and a second phase precursor;

b) generating an aerosol of droplets from said liquid solution;

c) moving said droplets in a carrier gas; and

d) heating said droplets to remove liquid therefrom and form composite sulfur-containing phosphor particles comprising a sulfur-containing phosphor compound and a second phase.

149. A method as recited in Claim 148, wherein said second phase comprises a second phosphor compound.

150. A method as recited in Claim 148, wherein said second phase comprises a metal oxide.

151. A display device for conveying visual graphics and information, comprising:

a) a plurality of pixel regions comprising phosphor powder layers; and

b) an excitation source adapted to stimulate said phosphor powder to emit light to be viewed by a viewer;

wherein said phosphor powder comprises sulfur-containing phosphor particles that are substantially spherical and have a weight average particle size of not greater than about 5 μm.

152. A display device as recited in Claim 151, wherein said weight average particle size is from about 0.3 μm to about 3 μm.

153. A display device as recited in Claim 151, wherein said powder has a particle size distribution wherein at least about 90 weight percent of said particles are not larger than twice said average particle size.

154. A display device as recited in Claim 151, wherein said phosphor powder layers have an average thickness of not greater than about 3 times said average particle size.

155. A display device as recited in Claim 151, wherein said phosphor powder layers have an average thickness of not greater than about 2 times said average particle size.

156. A display device as recited in Claim 151, wherein said phosphor particles comprise a metal sulfide host material.

157. A display device as recited in Claim 151, wherein said phosphor particles comprise a thiogallate host material.

158. A flat panel display, comprising:

a) an excitation source adapted to stimulate a phosphor; and

b) a viewing panel proximate to said excitation source, comprising a transparent substrate having disposed thereon a sulfur-containing phosphor powder defining pixels, wherein said phosphor powder comprises substantially spherical particles having a weight average particle size of not greater than about 10 μm.

159. A flat panel display as recited in Claim 158, wherein said weight average particle size is not greater than about 5 μm.

160. A flat panel display as recited in Claim 158, wherein said weight average particle size is from about 0.3 μm to about 3 μm.

161. A flat panel display as recited in Claim 158, wherein said powder has a particle size distribution wherein at least about 90 weight percent of said particles are not larger than twice said average particle size.

162. A flat panel display as recited in Claim 158, wherein said pixels comprise a phosphor powder layer having an average thickness of not greater than about 3 times said average particle size.

163. A flat panel display as recited in Claim 158, wherein said pixels comprise a phosphor powder layer having an average thickness of not greater than about 2 times said average particle size.

164. A flat panel display as recited in Claim 158, wherein said flat panel display is a field emission display.

165. A flat panel display as recited in Claim 158, wherein said flat panel display is a plasma display.

166. A flat panel display as recited in Claim 158, wherein said phosphor powder

comprises a metal sulfide host material selected from the Group 2 and Group 12 metal sulfides.

167. A flat panel display as recited in Claim 158, wherein said phosphor powder comprises a thiogallate host material.

168. A field emission display, comprising:

(a) a back plate portion comprising a plurality of electron tip emitters;

(b) a transparent front plate portion comprising a layer of phosphor powder comprising sulfur-containing phosphor particles, wherein said phosphor particles have a weight average particle size of not greater than about 5 μm and a particle size distribution wherein at least about 90 weight percent of said particles are not larger than twice said average particle size.

169. A field emission display as recited in Claim 168, wherein said phosphor particles comprise a metal sulfide host material.

170. A field emission display as recited in Claim 168, wherein said phosphor particles comprise ZnS and an activator ion selected from the group consisting of rare-earth elements, Ag, Cl, Cu and mixtures thereof.

171. A field emission display as recited in Claim 168, wherein said phosphor particles comprise a thiogallate host material.

172. A field emission display as recited in Claim 168, wherein said phosphor particles comprise $SrGa_2S_4$:Eu.

173. A field emission display as recited in Claim 168, wherein said phosphor particles comprise crystallites having an average crystallite size of at least about 40 nanometers.

174. A field emission display as recited in Claim 168, wherein said average particle size is from about 0.3 μm to about 3 μm.

175. A field emission display as recited in Claim 168, wherein said phosphor particles are substantially spherical.

176. A field emission display as recited in Claim 168, wherein said phosphor

particles form a pixel layer having an average thickness of not greater than about 2 times said average particle size.

177. A field emission display as recited in Claim 168, wherein said phosphor particles are coated phosphor particles comprising a coating substantially encapsulating said particles.

178. A field emission display as recited in Claim 168, wherein said phosphor particles are coated phosphor particles comprising a metal oxide coating substantially encapsulating said particles.

179. A field emission display as recited in Claim 168, wherein said phosphor particles are coated phosphor particles comprising a monolayer coating substantially encapsulating said particles.

180. A field emission display as recited in Claim 168, wherein said phosphor particles are coated phosphor particles comprising a coating substantially encapsulating said particles having an average thickness of not greater than about 10 nanometers.

181. An electroluminescent device, comprising an electrically insulative substrate, a first electrode supported on said substrate, a phosphor layer disposed over said first electrode, a second electrode disposed over said phosphor layer, and means for applying an electric field between said first and second electrodes, wherein said phosphor layer comprises phosphor powder comprising sulfur-containing phosphor particles, wherein said phosphor particles are substantially spherical and have a weight average particle size of not greater than about 5 μm

182. An electroluminescent device as recited in Claim 181, wherein at least about 90 weight percent of said phosphor particles are not larger than twice said average particle size.

183. An electroluminescent device as recited in Claim 181, wherein said average particle size is from about 0.3 to about 3 μm.

184. An electroluminescent device as recited in Claim 181, wherein said particles comprise crystallites having an average crystallite size of at least about 40 nanometers.

185. An electroluminescent device as recited in Claim 181, wherein said sulfur-containing phosphor particles comprise a metal sulfide host material.

186. An electroluminescent device as recited in Claim 181, wherein said sulfur-containing phosphor particles comprise ZnS.

187. An electroluminescent device as recited in Claim 181, wherein said sulfur-containing phosphor particles comprise a metal sulfide host material selected from the group consisting of CaS, SrS and BaS.

188. An electroluminescent device as recited in Claim 181, wherein said sulfur-containing phosphor particles comprise a mixed-metal sulfide of the general form $M^1_xM^2_{1-x}S$ wherein M^1 and M^2 are selected from the Group 2 metals.

189. An electroluminescent device as recited in Claim 181, wherein said sulfur-containing phosphor particles comprise a mixed-metal sulfide of the general form $M^1_xM^2_{1-x}S$ wherein M^1 and M^2 are selected from the Group 12 metals.

190. An electroluminescent device as recited in Claim 181, wherein said sulfur-containing phosphor particles comprise a thiogallate host material.

191. An electroluminescent device as recited in Claim 181, wherein said phosphor particles are coated phosphor particles.

192. An electroluminescent device as recited in Claim 181, wherein said phosphor particles are coated phosphor particles comprising a metal oxide coating substantially encapsulating said particles and having an average coating thickness of from about 2 to about 50 nanometers.

193. An electroluminescent device as recited in Claim 181, wherein said phosphor layer has a thickness that is not greater than about 3 times said average particle size.

194. An electroluminescent device as recited in Claim 181, wherein said device is an electroluminescent lamp.

195. An electroluminescent device as recited in Claim 181, wherein said device is an electroluminescent lamp and wherein said phosphor powder is dispersed in a flexible polymer.

196. An electroluminescent device as recited in Claim 181, wherein said device is an electroluminescent lamp and wherein said phosphor powder is dispersed on a rigid substrate.

197. An electroluminescent device as recited in Claim 181, wherein said device is an electroluminescent display device.

198. An electroluminescent device, comprising an electrically insulative substrate, a first electrode supported on said substrate, a phosphor layer disposed over said first electrode, a second electrode disposed over said phosphor layer, and means for applying an electric field between said first and second electrodes, wherein said phosphor layer comprises a phosphor powder comprising mixed-metal sulfide phosphor particles having an average particle size of not greater than about 5 μm.

199. An electroluminescent device as recited in Claim 198, wherein at least about 90 weight percent of said particles are not larger than twice said average particle size.

200. An electroluminescent device as recited in Claim 198, wherein said average particle size is from about 0.3 μm to about 3 μm.

201. An electroluminescent device as recited in Claim 198, wherein said sulfur-containing phosphor particles are substantially spherical.

202. An electroluminescent device as recited in Claim 198, wherein said phosphor particles comprise crystallites having an average crystallite size of at least about 25 nanometers.

203. An electroluminescent device as recited in Claim 198, wherein said sulfur-containing phosphor particles comprise a host material that is a mixed-metal sulfide of the general form $M^1_xM^2_{1-x}S$ wherein M^1 and M^2 are selected from the Group 2 metals.

204. An electroluminescent device as recited in Claim 198, wherein said sulfur-containing phosphor particles comprise a host material that is a mixed-metal sulfide of the general form $M^1_xM^2_{1-x}S$ wherein M^1 and M^2 are selected from the Group 2 metals and further comprise an activator ion selected from the group consisting of Eu, Ce, Mn and mixtures thereof.

205. An electroluminescent device as recited in Claim 198, wherein said sulfur-

containing phosphor powder is a mixed-metal sulfide of the general form $M^1_xM^2_{1-x}S$ wherein M^1 and M^2 are selected from the Group 12 metals.

206. An electroluminescent device as recited in Claim 198, wherein said sulfur-containing phosphor particles comprise a host material that is a mixed-metal sulfide of the general form $M^1_xM^2_{1-x}S$ wherein M^1 and M^2 are selected from the Group 12 metals and further comprising an activator ion selected from the group consisting of Cu, Mn and mixtures thereof.

207. An electroluminescent device as recited in Claim 198, wherein said sulfur-containing phosphor particles comprise a host material that is a mixed-metal sulfide of the general form $M^1_xM^2_yM^3_{1-x-y}S$.

208. A method for securing a document, comprising the step of applying a phosphor powder to said document, wherein said phosphor powder comprises phosphor particles, wherein said phosphor particles have a weight average particle size of not greater than about 5 μm.

209. A method for securing a document as recited in Claim 208, wherein said average particle size is from about 0.3 μm to about 3 μm.

210. A method as recited in Claim 208, wherein said phosphor particles are up-convertor phosphor particles.

211. A method as recited in Claim 208, wherein said phosphor particles are substantially spherical.

212. A method for securing a document as recited in Claim 208, wherein said particles have a particle size distribution wherein at least about 90 weight percent of said particles are not larger than twice said average particle size.

213. A method for securing a document as recited in Claim 208, wherein said phosphor particles comprise crystallites having an average crystallite size of at least about 25 nanometers.

214. A method for securing a document as recited in Claim 208, wherein said phosphor particles comprise a metal sulfide host material and at least two activator ions.

215. A method for securing a document as recited in Claim 208, wherein said phosphor particles comprise a metal sulfide host material selected from the group consisting of CaS, SrS and BaS and at least two activator ions.

216. A method for securing a document as recited in Claim 208, wherein said phosphor particles comprise an oxysulfide host material and at least two activator ions.

217. A method for securing a document as recited in Claim 208, wherein said

document is currency.

218. A method for securing a document as recited in Claim 208, wherein said phosphor particles are dispersed in an ink and are applied to said document to form identifying indicia.

219. A flowable medium suitable for applying phosphor particles onto a substrate, comprising:

a) a liquid vehicle phase; and

b) a functional phase dispersed throughout said vehicle phase, said functional phase comprising sulfur-containing phosphor particles, wherein said sulfur-containing phosphor particles are substantially spherical, have a weight average particle size of not greater than about 5 μm and an average crystallite size of at least about 25 nanometers.

220. A flowable medium as recited in Claim 219, wherein said sulfur-containing phosphor particles have a particle size distribution wherein at least about 90 weight percent of said phosphor particles are not larger than twice said average particle size.

221. A flowable medium as recited in Claim 219, wherein said vehicle phase is an aqueous-based solution.

222. A flowable medium as recited in Claim 219, wherein said vehicle phase is an aqueous-based solution comprising a dispersing agent.

223. A flowable medium as recited in Claim 219, wherein said flowable medium comprises from about 5 to about 95 weight percent of said sulfur-containing phosphor particles.

224. A flowable medium as recited in Claim 219, wherein said flowable medium comprises from about 60 to about 85 weight percent of said sulfur-containing phosphor particles.

225. A flowable medium as recited in Claim 219, wherein said sulfur-containing phosphor particles comprise a host material selected from the group consisting of metal sulfides, oxysulfides and thiogallates.

226. A flowable medium as recited in Claim 219, wherein said sulfur-containing

phosphor particles comprise a metal sulfide host material.

227. A flowable medium as recited in Claim 219, wherein said sulfur-containing phosphor particles comprise a mixed metal sulfide host material.

228. A flowable medium as recited in Claim 219, wherein said sulfur-containing phosphor particles comprise a thiogallate host material.

229. A flowable medium as recited in Claim 219, wherein said sulfur-containing phosphor particles comprise from about 0.02 to about 15 atomic percent of an activator ion.

230. A flowable medium as recited in Claim 219, wherein said sulfur-containing phosphor particles are coated phosphor particles comprising a coating substantially encapsulating said phosphor particles.

231. A paste composition suitable for applying phosphor particles onto a substrate, comprising:

a) a liquid vehicle phase; and

b) a functional phase dispersed throughout said vehicle phase, said functional phase comprising composite sulfur-containing phosphor particles having a weight average particle size of not greater than about 5 μm and a particle size distribution wherein at least about 90 weight percent of said particles are not larger than twice said average particle size.

232. A paste composition as recited in Claim 231, wherein said sulfur-containing phosphor particles comprise a host material selected from the group consisting of metal sulfides, oxysulfides and thiogallates.

233. A paste composition as recited in Claim 231, wherein said sulfur-containing phosphor particles comprise a metal sulfide host material.

234. A paste composition as recited in Claim 231, wherein said sulfur-containing phosphor particles comprise a mixed metal sulfide host material.

235. A paste composition as recited in Claim 231, wherein said sulfur-containing phosphor particles comprise from about 0.02 to about 15 atomic percent of an activator ion.

236. A paste composition as recited in Claim 231, wherein said phosphor particles are coated phosphor particles comprising a metal oxide coating.

237. A paste composition as recited in Claim 231, wherein said coating has an average thickness of not greater than about 50 nanometers.

238. A paste composition as recited in Claim 231, wherein said phosphor particles comprise crystallites having an average crystallite size of at least about 40 nanometers.

239. A paste composition as recited in Claim 231, wherein said phosphor particles

are substantially spherical.